

## 7.5 AIR QUALITY

### 7.5.1 Affected Environment

There are no air quality monitoring stations close to KTA or KLOA. The closest air quality monitoring stations are on the south side of O'ahu. Vehicle traffic, aircraft flight operations (mostly helicopters), and training munitions represent the majority of Army emission sources that are present intermittently at KTA and KLOA. Vehicle operations at KLOA are very limited and consist primarily of vehicle traffic between Schofield Barracks and KTA or KLOA. Most training at KLOA involves dismounted troop maneuvers and helicopter activity.

The Army has a remote weather station at KTA. Data from that station are used primarily in a real-time context for fire management. Consequently, comprehensive data summaries are not available. Two years of data from the KTA station show an average hourly wind speed of 13.7 mph (22 kmph) and a maximum hourly average wind speed of 34 mph (15.2 kmph). Hourly average wind speeds exceeded 9.9 mph (15.9 kmph) 75 percent of the time. Hourly average wind speeds at KTA exceeded the 15 mph (24 kph) threshold commonly associated with wind erosion processes about 40 percent of the time.

### 7.5.2 Environmental Consequences

#### **Summary of Impacts**

Two significant but mitigable air quality impacts have been identified at KTA under the Proposed Action or the RLA Alternative. Fugitive dust PM<sub>10</sub> emissions from military vehicle use on unpaved roadways and off-road areas would increase by 315 tons (286 metric tons) per year compared to No Action conditions. Visible dust is a clear indication of airborne PM<sub>10</sub> concentrations that are typically in the range of several thousand micrograms per cubic meter. It takes only a few hours of such concentrations to produce a 24-hour average that exceeds the state and federal 24-hour average PM<sub>10</sub> standard of 150 micrograms per cubic meter. PM<sub>10</sub> represents the size fractions of suspended particulate matter that are likely to penetrate into the lower respiratory tract, creating potential adverse health effects. The substantial increase in fugitive PM<sub>10</sub> emissions from military vehicle use at KTA, the potential for exceeding the federal 24-hour PM<sub>10</sub> standard, and the potential impacts to quality of life quality of life for those using recreational facilities in the KTA vicinity result in a significant air quality impact at KTA under the Proposed Action and the RLA. The impact from fugitive dust emissions would be reduced to a less than significant level through mitigation programs that include the use of washed gravel on military vehicle trails; periodic application of dust control chemicals; monitoring of ambient PM10 concentrations; and/or development of an adaptive management program to manage training area lands and modify training procedures as necessary to ensure compliance with federal air quality standards.

Wind erosion from areas disturbed by vehicle maneuver activity would increase by about 163 tons (148 metric tons) per year compared to No Action. The substantial increase in fugitive PM10 emissions from wind erosion at KTA, the potential for exceeding the federal 24-hour PM<sub>10</sub> standard, and the potential impacts to quality of life quality of life for those using recreational facilities in the KTA vicinity result in a significant but mitigable to less than

significant air quality impact at KTA under the Proposed Action and the RLA. The air quality impact from wind erosion at KTA would be reduced by management actions that help to maintain a high level of vegetation cover. In addition, the procedures used for estimating potential wind erosion may not adequately account for the persistence of high soil moisture conditions at KTA. High soil moisture conditions effectively eliminate wind erosion even if vegetation cover is substantially reduced on vehicle maneuver areas. The limited and somewhat scattered acreage at KTA subject to vehicle maneuver activity further reduces the potential magnitude of dust concentrations generated by wind erosion. Consequently, actual wind erosion problems at KTA are expected to be limited and should be amenable to control by management activities included in the DuSMMoP and ITAM programs.

Construction associated with KTA under the Proposed Action or Reduced Land Acquisition would include two FTI antennas, a tactical vehicle wash, and the CACTF. Maximum annual emissions from construction would create too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area. Nitrogen oxide emissions from construction equipment would be 21.5 tons (19.6 metric tons) in 2005, and less than 12 tons (11 metric tons) per year for the remainder of the construction period (through 2008). Nitrogen oxide emissions are of concern primarily as an ozone precursor. Emissions of ozone precursors from construction activities associated with the Proposed Action or the RLA Alternative would be too small to have a measurable effect on ozone levels, and would not change the attainment status of the area.

Ordnance use at KTA would decrease under the Proposed Action or Reduced Land Acquisition. Most ordnance would be blank ammunition or SRTA, with some smoke devices, flares, and simulators used at KTA. Because emission quantities from ordnance use are very small and include only trace quantities of hazardous components, no significant air quality impacts would occur and the attainment status of the area would not change.

SBCT transformation would add the Stryker armored vehicle to the tactical and support vehicle inventory used at KTA. As a result, vehicle use and resulting vehicle engine emissions would increase at KTA under the Proposed Action or Reduced Land Acquisition. The net increase in military vehicle engine emissions would be 1.3 tons (1.2 metric tons) per year for reactive organic compounds, 12.4 tons (11.3 metric tons) per year for nitrogen oxides, 3.9 tons (3.5 metric tons) per year for carbon monoxide, 0.14 ton (0.13 metric ton) per year for sulfur oxides, and 1.1 tons (1 metric ton) per year for PM<sub>10</sub>. These increases in military vehicle engine emissions would be too small to have meaningful effects on ambient air quality conditions or to affect the attainment status of the project area. Consequently, the increase in military vehicle engine emissions would have a less than significant impact on air quality.

The addition of UAV flight operations at KTA and KLOA under the Proposed Action or the RLA Alternative would result in a less than significant increase in overall aircraft emissions associated with use of these areas.

There would be a slight increase in the risk of wildfires at KTA under the Proposed Action or the RLA Alternative, but emissions associated with wildfires at KTA would remain a less than significant impact. No personnel are based at KTA or KLOA, so there would be no air quality impacts at KTA or KLOA from changes in personnel numbers under the Proposed Action or the RLA Alternative.

Table 7-12 summarizes the significance of air quality impacts at KTA and KLOA under the Proposed Action, RLA, and No Action.

**Table 7-12**  
**Summary of Potential Air Quality Impacts at KTA/KLOA**

Impact Issues	Proposed Action	Reduced Land Acquisition	No Action
Emissions from construction activities	⊙	⊙	○
Emissions from ordnance use	⊙	⊙	⊙
Engine emissions from military vehicle use	⊙	⊙	⊙
Fugitive dust from military vehicle use	⊗	⊗	⊙
Wind erosion from areas disturbed by military vehicle use	⊗	⊗	⊙
Emissions from increased aircraft operations	⊙	⊙	⊙
Emissions from wildfires	⊙	⊙	⊙
Other emissions from personnel increases	○	○	○

In cases when there would be both beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

**LEGEND:**

⊗ = Significant	○ = No impact
⊗ = Significant but mitigable to less than significant	⊕ = Beneficial impact
⊙ = Less than significant	N/A = Not applicable

***Proposed Action***

***Significant Impacts Mitigable to Less Than Significant***

Impact 1: Fugitive dust from military vehicle use. As many as 216 vehicles would travel along Helemanō Trail and Drum Road for a single exercise at KTA. Most vehicles probably would not travel to KTA and return to SBMR on the same day. For modeling purposes, the Army used a conservative estimate of 300 vehicles per day. Resulting PM<sub>10</sub> emissions would be approximately 476 tons (432 metric tons) per year, an increase of about 315 tons (286 metric tons) per year compared to No Action conditions.

Approximately 20 percent of the net increase in fugitive PM<sub>10</sub> emissions would be associated with vehicle travel on unpaved roads, while the remaining 80 percent represents potential emissions from off-road vehicle maneuver activity.

As discussed in Section 4.5, dispersion modeling analyses have been performed to better evaluate the potential for violating the federal PM<sub>10</sub> standard due to fugitive dust emissions

associated with military vehicle use. Modeling results for vehicle convoys along the Helemanō Trail were presented in Figure 5-11. Most vehicles on the Helemanō Trail would continue along Drum Road to KLOA and KTA. If road surfaces are dry and winds are light, even relatively modest numbers of vehicles can create sufficient dust to cause downwind PM<sub>10</sub> concentrations of more than 150 micrograms per cubic meter. In the absence of any dust control measures, daily traffic volumes of about 100 vehicles per day have the potential for causing PM<sub>10</sub> problems at locations within 2,000 feet (610 meters) of the roadway. Lower daily traffic volumes could cause PM<sub>10</sub> problems over shorter distances, and higher daily traffic volumes could cause PM<sub>10</sub> problems over larger distances.

Potential PM<sub>10</sub> problems from vehicle traffic on Helemanō Trail and Drum Road can be reduced substantially by a combination of feasible mitigation measures, including the use of washed gravel for surfacing military vehicle trails and/or implementing a dust management program that may include road paving or periodic application of chemical dust suppressants. Alternative dust control compounds include environmentally friendly hygroscopic salts (such as calcium chloride or magnesium chloride solutions) and synthetic polymer compounds (such as polyvinyl acetate or vinyl acrylic). If properly applied, dust control measures for unpaved roads would be expected to achieve at least 90 percent control of fugitive dust under the weather conditions and roadway use levels prevalent at USARHAW installations.

Fugitive dust generated by military vehicle maneuver traffic inside KTA poses the greatest potential for creating either nuisance conditions at nearby off-post locations or localized violations of the state or federal 24-hour average PM<sub>10</sub> standards. PM<sub>10</sub> represents the size fractions of suspended particulate matter that are likely to penetrate into the lower respiratory tract, creating potential adverse health effects.

KTA provides only limited areas suitable for off-road vehicle maneuver training. As indicated in Figure 2-5, available vehicle maneuver areas occur as multiple noncontiguous parcels. Most of the parcels suitable for vehicle maneuver exercises are along the northern and northeastern sides of KTA. In addition to small unit exercises, both company level and battalion level exercises are held at KTA. Modeling results for a company level exercise are presented in Figure 7-9, and modeling results for a battalion level exercise are presented in Figure 7-10. Small unit maneuvers are not expected to involve sufficient vehicle activity to create off-post PM<sub>10</sub> problems.

As was the case for the military vehicle trail modeling, the modeling analysis for vehicle maneuver exercises assumes that ground surface conditions are dry. In reality, ground surface conditions are likely to have sufficient moisture to substantially reduce fugitive dust emissions. As indicated in Figure 7-9, high PM<sub>10</sub> concentrations from a company level exercise would be limited to on-post locations even if such an exercise was conducted when ground surface conditions were dry. Battalion level exercises, on the other hand, have the potential for creating PM<sub>10</sub> concentrations that would exceed the level of the state and federal PM<sub>10</sub> standards at off-post locations (see Figure 7-10). However, high PM<sub>10</sub> concentrations from battalion level exercises would only occur if the ground surface is dry.

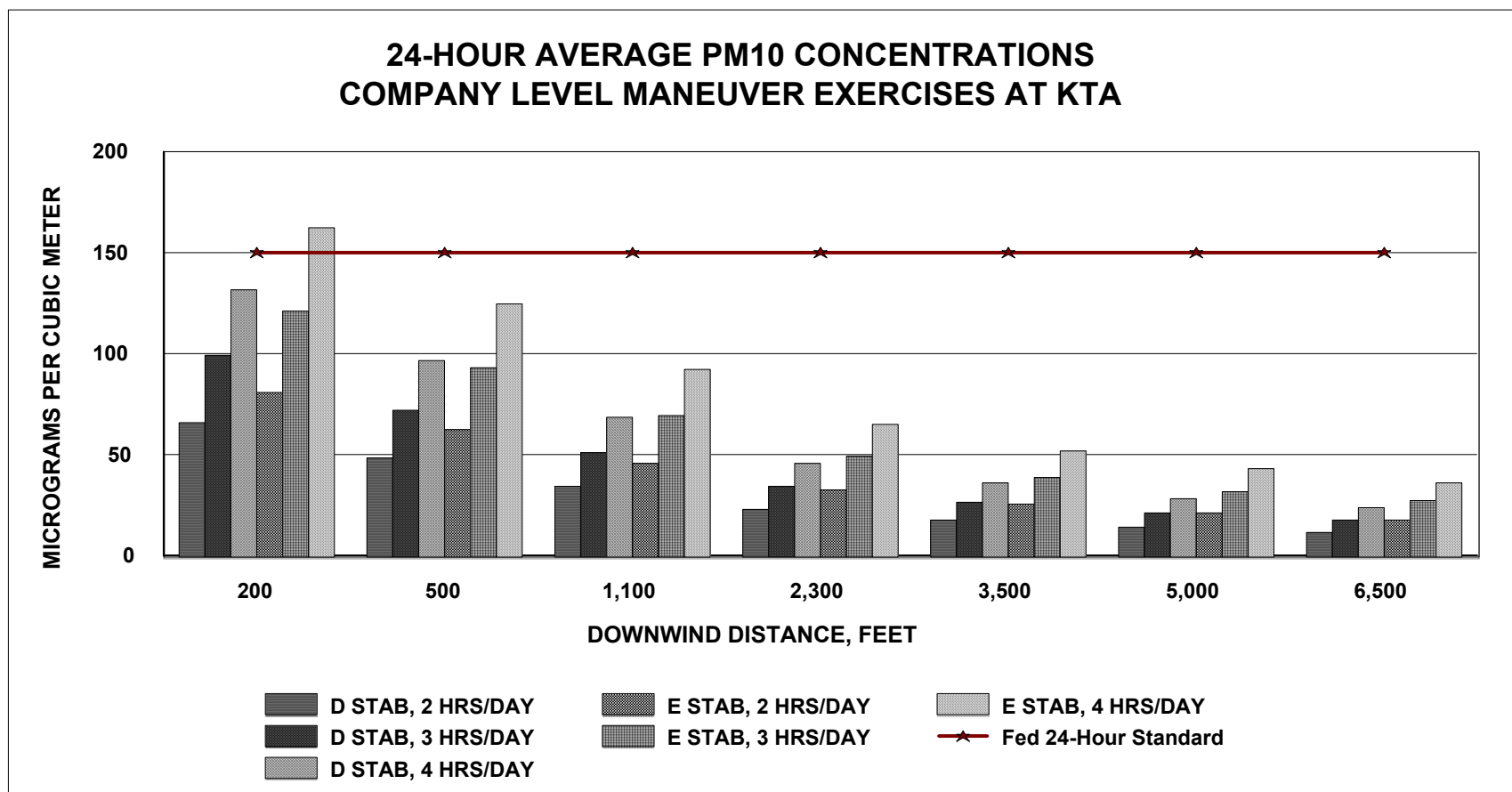


Chart shows potential PM<sub>10</sub> concentrations under two atmospheric stability conditions (neutral D stability and mild inversion E stability) and varied durations of vehicle maneuver activity during one or two company level exercise events in a single calendar day.

Figure 7-9. Potential PM<sub>10</sub> Concentrations Downwind of Company Level Vehicle Maneuver Exercise Activity at KTA

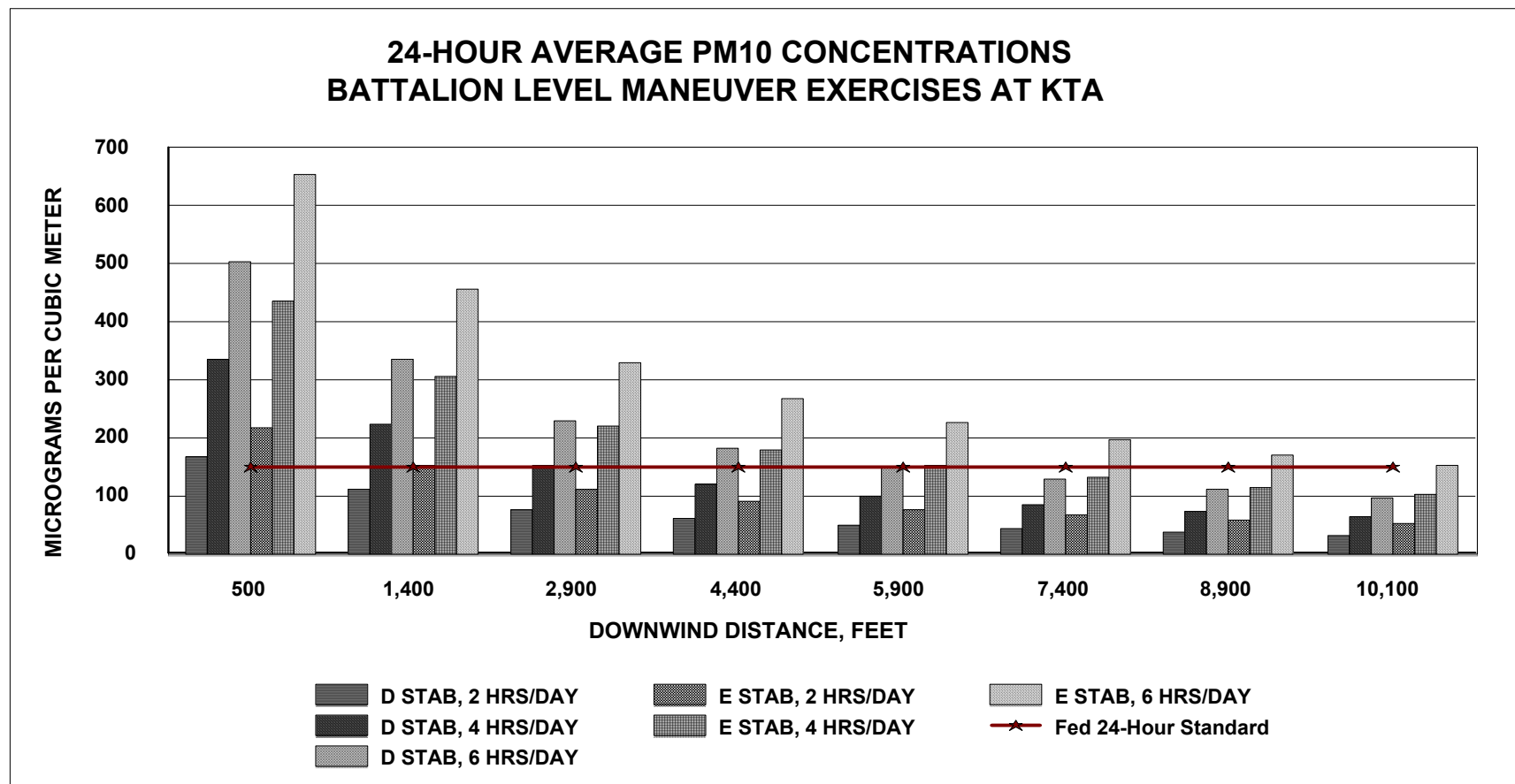


Chart shows potential PM<sub>10</sub> concentrations under two atmospheric stability conditions (neutral D stability and mild inversion E stability) and varied durations of vehicle maneuver activity during one or two battalion level exercise events in a single calendar day.

Figure 7-10. Potential PM<sub>10</sub> Concentrations Downwind of Battalion Level Vehicle Maneuver Exercise Activity at KTA

The impact of fugitive dust emissions from vehicle maneuver exercises would be reduced to a less than significant level through an Army commitment to an adaptive management program that adjusts the size and design of vehicle maneuver training events at KTA according to prevailing soil moisture conditions. The Proposed Action would have a significant but mitigable to less than significant impact from fugitive dust on air quality.

Regulatory and Administrative Mitigation 1. The Army will develop and implement a DuSMMoP for the training area, which will address measures such as, but not limited to, restrictions on the timing or type of training during high risk conditions, vegetation monitoring, dust monitoring, soil monitoring, and buffer zones to minimize dust emissions in populated areas. The Army will use the plan to determine how training will occur in order to keep fugitive dust emissions below CAA standards for PM<sub>10</sub> and soil erosion and compaction to a minimum. The Army will monitor the impacts of training activities to ensure that emissions stay within the acceptable ranges as predicted and environmental problems do not result from excessive soil erosion or compaction. The plan will also define contingency measures to mitigate the impacts of training activities that exceed the acceptable ranges for dust emissions or soil compaction.

The Army will continue to implement land restoration measures identified in the INRMP. Mitigation measures include, but are not limited to, implementation of the ITAM program to identify and inventory land condition using a GIS database; coordination between training planners and natural resource managers; implementation of land rehabilitation measures identified in the INRMP; monitoring of the effectiveness of the land rehabilitation measures; evaluation of erosion modeling data to identify areas in need of improved management; and implementation of education and outreach programs to increase user awareness of the value of good land stewardship.

To reduce fugitive dust associated with the use of military vehicle trails, the Army will implement dust control measures such as dust control chemical applications, the use of washed gravel for surfacing, spraying water, or paving sections of trails. The extent of gravel washing would have to balance dust reduction goals with engineering requirements for achieving a stable roadway surface. Selection of the appropriate dust control products would be based on testing alternative products on dirt and gravel road segments. Based on general characteristics and performance elsewhere, environmentally friendly synthetic polymers (such as polyvinyl acetate and vinyl acrylic) and hygroscopic salt solutions (such as calcium chloride or magnesium chloride) appear to be the most promising groups of dust control agents. The Army will monitor road surface conditions and will apply palliatives as necessary. If moisture levels are adequate to suppress dust, then application of dust palliatives would not be necessary. To the extent possible, the Army would plan dust suppressant applications to be scheduled to immediately precede periods of significant convoy traffic.

Impact 2: Wind erosion from areas disturbed by military vehicle use. Off-road vehicle activity can reduce or eliminate vegetation cover in affected areas, resulting in increased susceptibility to wind erosion. The amount of off-road vehicle activity at KTA would increase by 89 percent under the Proposed Action. This increase in off-road vehicle activity would reduce vegetation cover in the affected maneuver areas. An estimated 257 tons (233 metric tons) per

year of PM<sub>10</sub> would be generated by wind erosion from the affected areas. This would represent a net increase of about 163 tons (148 metric tons) per year compared to No Action.

As discussed for PTA in Section 8.5, dispersion modeling results for a 10,000-acre (4,047-hectare) area have been used to assess the extent to which high PM<sub>10</sub> concentrations might be generated by wind erosion. PM<sub>10</sub> emission rates from wind erosion are significantly higher at WPAA than at KTA due to differences in soil types, rainfall frequency, and soil moisture levels during dry periods. In addition, only about 620 acres (251 hectares) of land in several scattered parcels are available for off-road vehicle maneuver activity at KTA, while extensive contiguous acreage is available for vehicle maneuver activity at PTA. Thus, the analysis performed for PTA provides a very conservative indicator of potential wind erosion problems at KTA. When the differences in emission rates for wind erosion are taken into consideration, the analysis performed for PTA indicate that wind erosion at KTA is unlikely to generate PM<sub>10</sub> levels at off-post locations that would exceed state and federal air quality standards. The Army's DuSMMoP would help mitigate potential wind erosion problems by providing a management tool that would help limit damage to vegetation from off-road vehicle maneuver activity. Thus, wind erosion from the KTA is considered a significant but mitigable to less than significant air quality impact.

Regulatory and Administrative Mitigation 2. The Army will implement mitigation measures as described in Regulatory and Administrative Mitigation 1.

#### Less than Significant Impacts

Emissions from construction activities. The Proposed Action would include three construction projects at KTA occurring from 2005 into 2008. Construction projects would include a CACTF, a tactical vehicle wash facility, and two FTI towers. Figure 7-11 summarizes estimated emissions from the three construction projects according to current construction schedules. Nitrogen oxide emissions from construction equipment would be 21.5 tons (19.6 metric tons) in 2005, and less than 12 tons (11 metric tons) per year for the remainder of the construction period (through 2008). Nitrogen oxide emissions are of concern primarily as an ozone precursor. Emissions of ozone precursors from construction activities associated with the Proposed Action would be too small to have a measurable effect on ozone levels, and would not change the attainment status of the area. Construction contractors will comply with the provisions of Hawai'i Administrative Rules, Sec. 11-60.1-33, on Fugitive Dust as part of the requirements of construction contracts. Consequently, construction activities at KTA would have a less than significant air quality impact under the Proposed Action.

Emissions from ordnance use. Use of the CACTF at KTA would involve SRTA in addition to blank ammunition. Some pyrotechnic devices also would be used at KTA. Only blank ammunition would be used at KLOA. Due to changes in the nature of training activities, the annual quantity of ammunition used at KTA and KLOA would decrease by about 34 percent under the Proposed Action, compared to No Action. Emissions from ordnance use have not been quantified, but, as discussed for SBMR in Chapter 5, Section 5.5.2, pollutant emission quantities from ordnance use are small. Based on the general nature of detonation

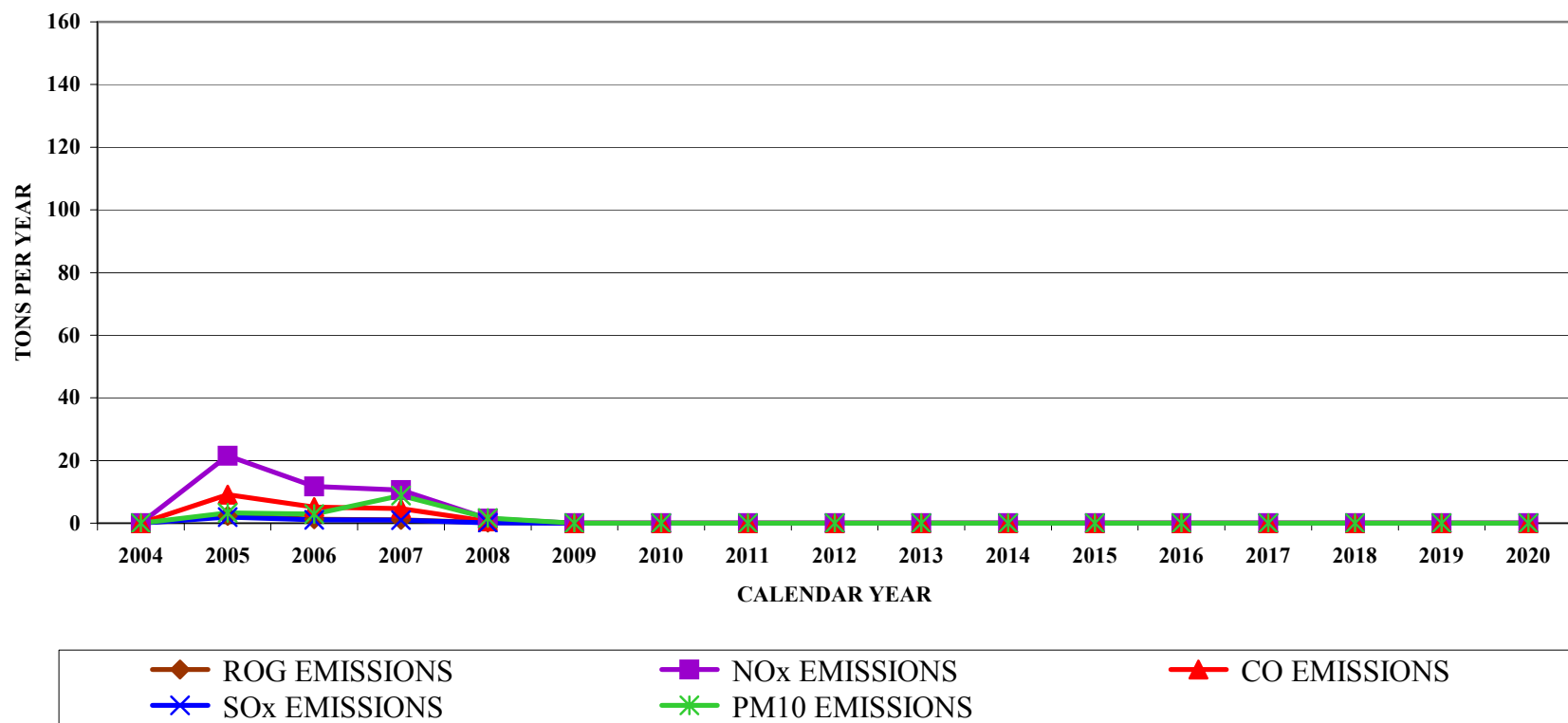


Figure 7-11 Annual Construction Emissions at Kahuku Training Area

processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with ordnance use at KTA and KLOA pose very little risk of creating adverse air quality impacts. Consequently, air quality impacts from munitions use under the Proposed Action are considered less than significant.

Engine emissions from military vehicle use. Military vehicle use at KTA and KLOA would result in as many as 241 vehicles participating in a single exercise. The change in overall vehicle use would represent a 77 percent increase in VMT and an 80 percent increase in vehicle operating hours, compared to No Action. Annual military vehicle emissions would increase by 145 percent compared to No Action conditions. Figure 7-12 summarizes the estimated net increase in annual engine emissions from military vehicle use at KTA and KLOA under the Proposed Action. The net increase in military vehicle engine emissions would be 1.3 tons (1.2 metric tons) per year for reactive organic compounds, 12.4 tons (11.3 metric tons) per year for nitrogen oxides, 3.9 tons (3.5 metric tons) per year for carbon monoxide, 0.14 ton (0.13 metric ton) per year for sulfur oxides, and 1.1 tons (1 metric ton) per year for PM<sub>10</sub>. The net increase in military vehicle engine emissions would be too small to have meaningful effects on ambient air quality conditions or to affect the attainment status of the project area. Consequently, emissions from military vehicle use at KTA and KLOA would be a less than significant impact under the Proposed Action.

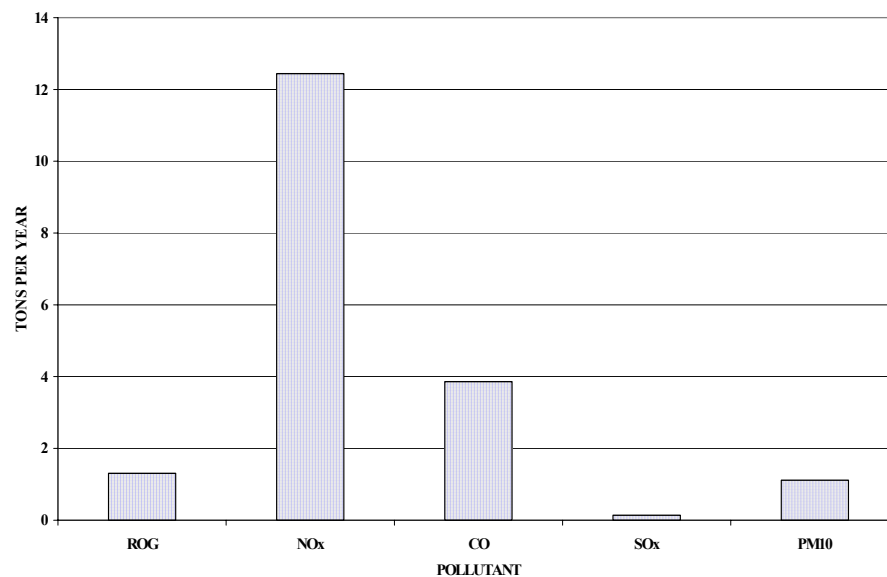


Figure 7-12. Net Change in Military Vehicle Emissions for the Proposed Action: Kahuku Training Area

Emissions from increased aircraft operations. The Proposed Action would not result in any major change to Army helicopter flight operations in Hawai'i. Some UAV flight activity could be based at KTA, but the total flight time would be relatively low. The net increase in emissions resulting from UAV flight activity would be too small to have a meaningful effect on ambient air quality conditions. Consequently, the increase in aircraft emissions at KTA and KLOA under the Proposed Action would be a less than significant impact.

Emissions from wildfires. The Proposed Action would include the use of SRTA at KTA, which might create a slightly increased risk of wildfires. However, overall ordnance use at KTA and KLOA would decrease by 34 percent compared to No Action. Consequently, there would be little change in the overall risk of wildfires. Because the overall frequency and size of wildfires at KTA and KLOA is not expected to change substantially from present conditions, emissions from wildfires would be a less than significant impact under the Proposed Action.

#### No Impact

Other emissions from personnel increases. No Army personnel are based at KTA or KLOA, and the installations do not have any stationary emission sources, so the Proposed Action would not result in any emissions from personal vehicle use or any increase in emissions from fixed facilities at KTA.

#### **Reduced Land Acquisition**

Air quality impacts and mitigations at KTA under the RLA Alternative would be the same as under the Proposed Action.

#### **No Action**

#### Less than Significant Impacts

Emissions from ordnance use. Overall ordnance use under No Action would be 52 percent greater than under the Proposed Action or the RLA Alternative. Based on the general nature of detonation processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with training ordnance use at KTA and KLOA pose very little risk of creating adverse air quality impact; consequently, air quality impacts from continued Legacy Force munitions use under No Action is considered less than significant.

Engine emissions from military vehicle use. Vehicle use associated with KTA and KLOA would remain at present levels under No Action. Estimated annual emissions from vehicle engine operations would be approximately the following:

- 0.9 ton (0.8 metric ton) of reactive organic compounds;
- 8.6 tons (7.8 metric tons) of nitrogen oxides;
- 2.7 tons (2.4 metric tons) of carbon monoxide;
- 0.1 ton (0.09 metric ton) of sulfur oxides; and
- 0.8 ton (0.7 metric ton) of PM<sub>10</sub>.

The amount of military vehicle engine emissions would be too small to have meaningful effects on ambient air quality conditions. Consequently, military vehicle engine emissions would have a less than significant impact under No Action.

Fugitive dust from military vehicle use. Vehicle numbers and estimated annual use levels would remain at current conditions under No Action. Fugitive dust PM<sub>10</sub> emissions from military vehicle use at KTA and KLOA would remain at the current level of about 161 tons (146 metric tons) per year. Because existing conditions at KTA and KLOA have not led to any known violations of state or federal ambient air quality standards, the fugitive dust from military vehicle use at KTA and KLOA would have a less than significant impact under No Action.

Wind erosion from areas disturbed by military vehicle use. Vehicle maneuver activity at KTA would remain the same as current conditions under No Action. An estimated 93 tons (84 metric tons) per year of PM<sub>10</sub> would be generated by wind erosion from the affected areas. Wind erosion from disturbed areas would be too small to have a meaningful effect on ambient air quality conditions, and therefore would be a less than significant impact under No Action.

Emissions from increased aircraft operations. There would be no change in aircraft operations and no increase in aircraft emissions at KTA and KLOA under No Action. Because there would be no change from current conditions and because current conditions have not been known to violate any state or federal ambient air quality standards, emissions from aircraft operations under No Action would have a less than significant impact on air quality.

Emissions from wildfires. The risk of wildfires at KTA and KLOA would remain the same as that for current conditions under No Action. Because the frequency and size of wildfires at KTA and KLOA is not expected to change, emissions from wildfires would be a less than significant impact under No Action.

#### No Impact

Emissions from construction activities. No construction projects are associated with No Action, so there would be no air quality impact from construction under No Action.

Other emissions from personnel increases. There are no personnel based at either KTA or KLOA, so No Action would not result in any emissions from added personal vehicle use or any increase in emissions from fixed facilities.